

Assessment of Inventory and Resource Management in Automobile Rebuilding Operation at G-Tecnica Equipment Corporation

JAYMART O. JOSE¹, MACKENLY A. PERNIA², JAY-AR J. VICENTE³, NOEL T.
FLORENCONDIA⁴

^{1, 2, 3, 4}Graduate School, Nueva Ecija University of Science and Technology

Abstract- Efficient inventory and resource management is critical in automobile rebuilding operations, where delays, material shortages, and inefficient resource allocation can significantly affect productivity and service quality. This study assessed the inventory and resource management practices of G-Tecnica Equipment Corporation in terms of stock availability, storage and organization, monitoring and control, procurement and replenishment, as well as labor, equipment, and time management. A quantitative descriptive-correlational research design was used, with data collected from employees directly involved in automobile rebuilding operations through a structured questionnaire. Data were analyzed using frequency, percentage, weighted mean, ranking, and Pearson correlation. Results revealed that inventory management practices were generally rated as moderate, with stock availability and procurement processes identified as areas needing improvement due to occasional shortages and delays. Storage, organization, and monitoring practices were assessed as satisfactory. Resource management practices were rated as generally effective, particularly in labor, equipment, and time management. Operational issues such as delays and resource inefficiencies were present but not considered severe. Overall, respondents indicated that current practices support operational efficiency to a satisfactory extent. The study concludes that while the company demonstrates generally effective management systems, improvements in inventory tracking, procurement planning, and system automation are necessary to enhance operational performance. Adoption of computerized inventory systems and strengthened coordination with suppliers are recommended.

Index Terms — Inventory Management, Resource Management, Automobile Rebuilding, Operational Efficiency, Procurement Management

I. INTRODUCTION

Inventory and resource management are essential components of operational efficiency in industries that rely heavily on spare parts, manpower, and equipment such as automobile rebuilding operations. Effective management of materials, tools, labor, and operational schedules contributes significantly to service quality, productivity, and cost control. According to Georgiev et al. (2024), improved inventory management systems enhance operational efficiency and minimize disruptions caused by shortages and delays.

In automobile rebuilding operations, the availability of spare parts and proper allocation of labor and equipment are necessary to ensure smooth operational flow and timely completion of rebuilding tasks. Poor inventory control may result in delays, operational inefficiencies, and unnecessary costs. As a result, organizations must continuously improve their inventory and resource management systems to support operational performance.

G-Technica Equipment Corporation is engaged in automobile rebuilding and equipment restoration services requiring efficient coordination of inventory materials, manpower, tools, and operational schedules. This study aimed to assess the inventory and resource management practices of the company and identify possible improvements to enhance operational efficiency.

Specifically, the study sought to answer the following questions:

1. How may the inventory management practices of G-Technica Equipment Corporation be assessed in terms of:
 - 1.1 Stock availability
 - 1.2 Storage and organization
 - 1.3 Monitoring and control
 - 1.4 Procurement and replenishment
2. How may resource management practices be assessed in terms of:
 - 2.1 Labor management
 - 2.2 Equipment management
 - 2.3 Time management
3. What problems are encountered in inventory and resource management?
4. How effective are the current inventory and resource management practices in supporting operational efficiency?
5. What improvements may be proposed to enhance the company's inventory and resource management system?

This study may benefit automobile rebuilding companies, employees, instructors, researchers, and operations management practitioners by providing relevant information regarding operational efficiency and inventory management practices.

II. REVIEW OF RELATED LITERATURE

Heizer, Render, and Munson (2020) stated that inventory management is the systematic process of ordering, storing, recording, and controlling stocks to ensure availability while minimizing cost. It was considered a critical business function because it directly affects productivity, customer service, and profitability. In automobile rebuilding operations, inventory commonly includes spare parts, bearings, seals, lubricants, fasteners, tools, and consumables. Effective inventory systems reduce stockouts, excess inventory, delays, and waste. The authors emphasized that proper inventory management ensures that the right quantity of materials is available at the right time while minimizing holding and ordering costs.

Heizer, Render, and Munson (2020) further stated that resource management refers to the efficient

utilization of labor, equipment, machinery, time, and workspace. In rebuilding operations, productivity depends on proper worker assignment, machine availability, preventive maintenance, and job scheduling. Proper allocation of manpower and tools reduces idle time and increases output.

Richards (2018) stated that warehouse management is essential because organized storage improves retrieval speed, inventory accuracy, and safety. He explained that labeling, bin locations, stock coding, and regular counts help maintain control. According to Richards, warehouse layout and discipline significantly influence productivity and service speed. Modern firms increasingly use computerized systems such as spreadsheets, barcode systems, and ERP software to monitor stock movement, generate reports, and support purchasing decisions. These digital systems reduce human error and improve accountability in inventory tracking and control.

Spare parts management is highly relevant in automobile rebuilding because operations involve different brands and models that require specific parts. Maintaining adequate stock of critical items while controlling slow-moving stock is necessary to avoid delays and excessive capital tied up in inventory. Forecasting also plays an important role in determining future material requirements. Historical usage records and seasonal demand trends can help firms establish reorder points and avoid emergency purchases.

Prior studies consistently indicate that organizations with accurate inventory records and efficient resource allocation systems experience fewer delays, lower operating costs, and higher service efficiency. Foreign studies on spare parts and maintenance operations show that accurate inventory records improve service speed and reduce downtime. Zhang et al. found that optimized spare parts control lowers maintenance cost and increases availability of needed items.

Research on SMEs indicates that manual systems often lead to inaccurate counts, emergency purchasing, delayed operations, and poor coordination among departments. Other studies found

that preventive maintenance and efficient scheduling improve labor productivity and equipment utilization. Studies in automotive parts supply chains revealed that supplier lead time, demand uncertainty, and stock classification significantly affect inventory performance. Local studies on Philippine SMEs also show that many small and medium businesses still rely on manual inventory methods. These firms commonly encounter stock discrepancies, lack of real-time monitoring, and weak documentation systems.

Although many studies discuss manufacturing and retail inventory systems, limited studies focus specifically on automobile rebuilding firms. This creates a research gap that the present study intends to address.

III. RESEARCH METHODOLOGIES

Research Design

This study utilized a quantitative research design, specifically a descriptive-correlational approach. Quantitative data were gathered through structured survey questionnaires, while qualitative inputs were obtained through open-ended questions included in the instrument. A survey-based research methodology was employed using a single-method design. Primary data were derived from the respondents' answers to a structured questionnaire focused on inventory management practices, resource management practices, problems encountered, and operational efficiency in automobile rebuilding operations.

Locale of the Study

The study was conducted at G-Tecnica Equipment Corporation, Cabanatuan Branch, located in Caalibangbangan, Cabanatuan City, Nueva Ecija. The company was selected as the research locale because it is engaged in automobile rebuilding operations that require effective inventory and resource management systems.

Sample and Sampling Procedure

The study utilized a purposive sampling technique. Respondents were selected based on their direct involvement in inventory handling and automobile

rebuilding operations. This ensured that only individuals with relevant knowledge and experience were included in the study.

Respondents of the Study

The respondents of the study consisted of employees of G-Tecnica Equipment Corporation involved in automobile rebuilding operations. These included managers, supervisors, mechanics/workers, and other personnel engaged in inventory and operational activities. Respondents varied in terms of years of experience, ensuring a diverse representation of operational insights.

Research Instrument

The study employed a structured questionnaire as the primary research instrument. The questionnaire consisted of six components: (1) Respondent Profile, (2) Inventory Management Practices in terms of stock availability, storage and organization, monitoring and control, and procurement and replenishment, (3) Resource Management Practices in terms of labor management, equipment utilization, and time management, (4) Problems Encountered, (5) Effectiveness of Current Practices, and (6) Recommendations. A 5-point Likert scale was used ranging from Strongly Disagree (1) to Strongly Agree (5).

Data Gathering Procedure

After securing approval from the company, the questionnaire was distributed to selected respondents through Google Forms. Respondents were given sufficient time to accomplish the survey. After data collection, responses were automatically recorded, organized, and prepared for statistical analysis. Confidentiality and anonymity of respondents were strictly observed throughout the process.

Data Analysis Technique

The data gathered were analyzed using statistical tools appropriate for quantitative research. Frequency and percentage were used to describe respondent profiles. Weighted mean was used to determine the level of inventory and resource management practices, as well as the effectiveness of operations. Ranking was used to identify the most common problems encountered. Pearson Product-Moment

Correlation Coefficient (Pearson r) was used to determine the relationship between inventory management, resource management, and operational efficiency.

Ethical Consideration

The study observed ethical standards in research by ensuring voluntary participation, confidentiality, and anonymity of respondents. Data collected were used solely for academic purposes. The principles of the Data Privacy Act of 2012 were followed to ensure that all personal information provided by respondents was properly protected and secured.

IV. RESULT AND DISCUSSION

Table 1. Distribution of Respondents According to Position/Role

Position/Role	Percentage
Mechanic/Worker	50%
Supervisor	10%
Manager	5%
Admin Personnel	5%
Sales and Production Staff	5%
Private Employee	5%
Sales Admin	5%
Former Employee	5%
Others	10%

Table 1 shows the distribution of respondents according to their position or role. The majority of respondents, comprising 50%, are mechanics/workers. Supervisors and respondents categorized as “others” account for 10% each, while managers, admin personnel, sales and production staff, private employees, sales administrators, and former employees each represent 5% of the respondents.

Table 2. Distribution of Respondents According to Years of Experience

Years of Experience	Percentage
Less than 1 year	45%
1–3 years	30%
4–6 years	15%
More than 6 years	10%

Table 2 reveals that 45% of the respondents have less than one year of experience, making it the largest group among the respondents. Meanwhile, 30% have 1–3 years of experience, 15% have 4–6 years of experience, and 10% have more than 6 years of service.

The respondents evaluated the company’s inventory management practices using a 5-point Likert scale where:

Scale	Verbal Interpretation
5	Strongly Agree
4	Agree
3	Neutral
2	Disagree
1	Strongly Disagree

Table 3. Stock Availability

Indicators	Weighted Mean	Interpretation
Required materials and parts are readily available when needed.	3.35	Neutral
Operational activities are not disrupted due to insufficient inventory.	3.10	Neutral
The company maintains adequate stock levels to support operations.	3.40	Neutral
Overall Mean	3.28	Neutral

The results show that the respondents gave an overall weighted mean of 3.28, interpreted as Neutral. The highest mean of 3.40 was obtained by the statement regarding the company maintaining adequate stock levels to support operations, while the lowest mean of 3.10 was obtained by the statement concerning

operational disruptions caused by insufficient inventory.

Table 4. Storage and Organization

Indicators	Weighted Mean	Interpretation
Materials and parts are properly stored and systematically organized.	3.50	Agree
Inventory items can be easily identified and retrieved when needed.	3.35	Neutral
Storage areas are maintained in a safe and orderly condition.	3.55	Agree
Overall Mean	3.47	Agree

Table 4 indicates an overall weighted mean of 3.47, interpreted as Agree. The highest mean was 3.55 for maintaining storage areas in a safe and orderly condition, while the lowest mean was 3.35 regarding the ease of identifying and retrieving inventory items.

Table 5. Monitoring and Control

Indicators	Weighted Mean	Interpretation
The company effectively monitors and tracks inventory levels.	3.40	Neutral
Inventory records are accurate, updated, and reliable.	3.50	Agree
A clear and structured system for inventory	3.45	Agree

control is implemented.		
Overall Mean	3.45	Agree

The table presents an overall weighted mean of 3.45, interpreted as Agree. The statement regarding accurate and updated inventory records obtained the highest mean of 3.50, while monitoring and tracking inventory levels received the lowest mean of 3.40.

Table 6. Procurement and Replenishment

Indicators	Weighted Mean	Interpretation
Materials and parts are procured in a timely manner.	3.35	Neutral
Deliveries of supplies are received without significant delays.	3.20	Neutral
Inventory replenishment processes are carried out efficiently.	3.30	Neutral
Overall Mean	3.28	Neutral

Table 6 shows an overall weighted mean of 3.28, interpreted as Neutral. The highest mean was obtained by timely procurement of materials and parts, while the lowest mean was associated with delays in receiving deliveries.

Table 7. Labour Management

Indicators	Weighted Mean	Interpretation
Tasks are appropriately assigned based on roles.	3.55	Agree
Workload is distributed fairly among employees.	3.45	Agree
Employees' skills and competencies are effectively utilized.	3.65	Agree
Overall Mean	3.55	Agree

The overall weighted mean for labour management is 3.55, interpreted as Agree. Effective utilization of employees' skills obtained the highest mean.

Table 8. Equipment Management

Indicators	Weighted Mean	Interpretation
Tools and equipment are available when required.	3.50	Agree
Equipment is utilized efficiently in operations.	3.55	Agree
Regular maintenance of tools and equipment is conducted.	3.45	Agree
Overall Mean	3.50	Agree

The results indicate that equipment management practices are generally effective. Availability and maintenance of tools support operational continuity and reduce downtime in rebuilding operations.

Table 9. Time Management

Indicators	Weighted Mean	Interpretation
Work schedules are effectively planned and implemented.	3.55	Agree
Assigned tasks are completed within the expected timeframe.	3.50	Agree
Operational delays are kept to a minimum.	3.50	Agree
Overall Mean	3.52	Agree

The findings imply that time management practices contribute positively to operational efficiency. Proper scheduling and timely completion of tasks help minimize operational delays.

Part IV. Problems Encountered

Table 10. Problems Encountered in Inventory and Resource Management

Problems Encountered	Weighted Mean	Interpretation
Shortages of materials and parts occur frequently.	3.10	Neutral
Overstocking of inventory is observed within the company.	2.85	Neutral
Labour and equipment are not utilized efficiently.	3.00	Neutral
Delays in operations occur frequently.	3.20	Neutral
Overall Mean	3.04	Neutral

The respondents moderately observed operational problems related to inventory and resource management. Delays in operations received the highest mean, suggesting that operational interruptions remain a concern. However, the overall neutral interpretation indicates that such problems are not excessively severe but still require improvement.

Table 11. Effectiveness of Current Inventory and Resource Management Practices

Indicators	Weighted Mean	Interpretation
Inventory management practices support smooth operational flow.	3.45	Agree
Resource management practices contribute to operational efficiency.	3.55	Agree
Overall operations are effectively managed.	3.60	Agree
Overall Mean	3.53	Agree

The findings reveal that respondents generally agree that the company's current inventory and resource management practices support operational efficiency. This indicates that existing systems and practices contribute positively to workflow, productivity, and operational performance.

The respondents provided several recommendations to improve inventory and resource management practices. Most respondents suggested improving inventory organization by labeling materials with names and codes for easier identification and retrieval. Others recommended regularly updating inventory records and implementing advanced

technological systems for monitoring and tracking inventory movement.

In terms of resource management, respondents recommended automating repetitive administrative tasks, improving coordination among departments, enhancing workload allocation, and providing additional training and seminars for employees.

Additional comments emphasized the importance of stricter scheduling, increased workplace security, and adopting systematic operational approaches to improve productivity while minimizing manpower requirements.

The recommendations provided by the respondents indicate the need for continuous improvement in operational systems and workforce development. Implementing technological advancements, systematic inventory procedures, and employee training programs may further strengthen the company's operational efficiency and resource management practices.

Output

Key Element	Purpose	Action / Practices
Inventory Management System	To ensure proper control and availability of materials and reduce delays in automobile rebuilding operations	Implement standardized stock monitoring, proper labeling and coding of parts, regular inventory audits, and structured procurement and replenishment procedures
Resource Management System (Labor, Equipment, Time)	To improve operational efficiency through optimal utilization of manpower, tools, and working hours	Assign tasks based on skills, balance workload distribution, ensure preventive maintenance of equipment, and implement structured work scheduling
Computerized	To improve	Adopt digital

Inventory System	accuracy, speed, and reliability of inventory tracking and reduce human errors	inventory tools such as spreadsheet systems, barcode-based tracking, or simple inventory software for real-time monitoring and reporting
Operational Coordination System	To reduce delays and improve workflow efficiency across departments involved in rebuilding operations	Strengthen communication between departments, improve job scheduling, coordinate procurement timing, and streamline workflow processes
Employee Development Program	To enhance workforce capability and improve overall productivity in operations	Conduct regular training, seminars, and skills enhancement programs focused on inventory handling, equipment use, and operational efficiency

Inventory management practices in the company are generally moderate to effective. Stock availability (3.28) and procurement and replenishment (3.28) are interpreted as neutral, indicating that while materials are generally available, occasional shortages and delays in supply still occur. On the other hand, storage and organization (3.47) and monitoring and control (3.45) are interpreted as agree, showing that inventory is generally well-organized, properly stored, and reasonably monitored.

Resource management practices are generally effective. Labour management obtained a weighted mean of 3.55, equipment management 3.50, and time management 3.52, all interpreted as agree. This indicates that manpower is appropriately assigned, equipment is generally available and well-maintained, and work schedules are properly managed, contributing to smooth operational flow. The study also found that the problems encountered in inventory and resource management are moderate, with an overall weighted mean of 3.04 interpreted as neutral. Among the issues identified, operational delays were the most commonly observed concern, indicating that disruptions in workflow still occur but are not severe enough to critically affect operations.

In terms of effectiveness, the overall assessment (3.53) indicates that the current inventory and resource management practices are generally effective in supporting automobile rebuilding operations. These systems contribute positively to productivity, workflow efficiency, and operational performance within the organization.

Overall, the findings conclude that while G-Tecnica Equipment Corporation has generally effective inventory and resource management practices, there are still operational gaps—particularly in procurement processes, inventory availability, and coordination—that need improvement to further enhance efficiency and reduce delays.

V. FINDINGS AND CONCLUSIONS

Findings and Conclusions

The findings of this study show that the demographic profile of respondents from G-Tecnica Equipment Corporation indicates that most are mechanics/workers, comprising the majority of the workforce, while the rest are supervisors and other personnel involved in automobile rebuilding operations. In terms of experience, most respondents have less than one year of service, followed by those with one to three years, indicating a relatively young workforce with direct involvement in daily operational activities.

VI. RECOMMENDATIONS

To further improve inventory and resource management practices, it is recommended that G-Tecnica Equipment Corporation implement a

computerized inventory management system to improve accuracy, monitoring, and real-time tracking of materials and parts.

The company should strengthen its inventory organization through proper labeling, coding, and systematic storage to improve accessibility and reduce delays in locating materials during operations. It is also recommended that procurement and replenishment processes be improved by enhancing supplier coordination, establishing proper forecasting methods, and setting optimal reorder levels to prevent shortages and delays.

Regular inventory audits and monitoring should be conducted to ensure accuracy of records and to minimize discrepancies such as overstocking and stock shortages.

In terms of resource management, the company should continue strengthening labor and equipment utilization through training programs, skill enhancement seminars, and proper task assignment to improve productivity.

Improvement in operational scheduling and coordination among departments is also recommended to minimize delays and improve turnaround time in automobile rebuilding operations. Lastly, future researchers are encouraged to conduct similar studies with a wider scope, additional variables, or comparative analysis across multiple automobile rebuilding companies to further validate and expand the findings of this study.

VII. ACKNOWLEDGEMENT

The researchers would like to express their sincere gratitude to Dr. Noel Florencondia, their subject professor, for his continuous guidance, support, and valuable insights that significantly contributed to the completion of this study. His expertise and constructive feedback played an important role in shaping the direction and quality of this research. They are also grateful to the Nueva Ecija University of Science and Technology – Graduate School for providing the opportunity, academic support, and learning environment necessary for the conduct of

this study. Special appreciation is extended to G-Tecnica Equipment Corporation for allowing the researchers to conduct the study within their organization. The researchers are deeply thankful to the management and employees who generously shared their time, experiences, and cooperation during the data gathering process. Their assistance was essential in the successful completion of this research.

REFERENCES

- [1] Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), 99–120. URL: <https://doi.org/10.1177/014920639101700108>, Date Retrieved: March 12, 2025
- [2] Fernández-Caramés, T. M., Blanco-Novoa, O., Froiz-Míguez, I., & Fraga-Lamas, P. (2019). Towards an Autonomous Industry 4.0 Warehouse: A UAV and Blockchain-Based System for Inventory and Traceability Applications in Big Data-Driven Supply Chain Management. *Sensors*, 19(10), 2394. URL: <https://doi.org/10.3390/s19102394>, Date Retrieved: August 18, 2024
- [3] Georgiev, I., Grozev, D., Beloev, I., Milchev, M., & Gladkova, V. (2024). Enhancing inventory optimization and management for automotive repair shops. *AIP Conference Proceedings*. URL: <https://doi.org/10.1063/5.0201437>, Date Retrieved: February 6, 2025
- [4] Heizer, J., Render, B., & Munson, C. (2020). *Operations Management: Sustainability and Supply Chain Management* (13th ed.). Pearson. URL: <https://www.pearson.com>, Date Retrieved: January 15, 2026
- [5] Kennedy, W. J., Patterson, J. W., & Fredendall, L. D. (2002). An overview of recent literature on spare parts inventories. *International Journal of Production Economics*, 76(2), 201–215. URL: [https://doi.org/10.1016/S0925-5273\(01\)00174-8](https://doi.org/10.1016/S0925-5273(01)00174-8), Date Retrieved: September 9, 2024
- [6] Laudon, K. C., & Laudon, J. P. (2025). *Management Information Systems: Managing the Digital Firm* (16th ed.). Pearson. URL: <https://www.pearson.com>, Date Retrieved: April 10, 2026

- [7] Maitra, S. (n.d.). Inventory Management Under Stochastic Demand: A Simulation-Optimization Approach. arXiv. URL: <https://arxiv.org/pdf/2406.19425>, Date Retrieved: June 20, 2025
- [8] Monczka, R. M., Handfield, R. B., Giunipero, L. C., & Patterson, J. L. (2016). Purchasing and Supply Chain Management (6th ed.). Cengage Learning. URL: <https://www.cengage.com>, Date Retrieved: October 3, 2024
- [9] Naelgas, M. A. (2022). Standardized Equipment Management Procedures and Fleet Management of DPWH Region IV-A. Research Square. URL: <https://doi.org/10.21203/rs.3.rs-2323825/v1>, Date Retrieved: November 14, 2024
- [10] Silva, Â., Silva, M., & Ferreira, A. C. (2025). Inventory management and its influence on the supply of high-value products: Case study evidence. *Logistics*, 9(4), 170. URL: <https://doi.org/10.3390/logistics904170>, Date Retrieved: February 28, 2026
- [11] Slack, N., & Brandon-Jones, A. (2019). *Operations Management* (9th ed.). Pearson. URL: <https://www.pearson.com>, Date Retrieved: July 22, 2024
- [12] Stevenson, W. J. (2021). *Operations Management* (14th ed.). McGraw-Hill Education. URL: <https://www.mheducation.com>, Date Retrieved: December 8, 2025
- [13] Stephenson, S. (n.d.). Manufacturing of Car in the Philippines. APEC. URL: <https://apec.org/docs/default-source/Publications/2015/11/Services-in-Global-Value-Chains-Manufacturing-Related-Services/TOC/Chapter-9-Manufacturing-of-Car-in-the-Philippines.pdf>, Date Retrieved: May 5, 2024
- [14] Yang, Y. (2025). A Comprehensive Review of Inventory Management in Automotive Parts Supply Chains. *International Journal of Global Economics and Management*, 6(2), 107–115. URL: <https://doi.org/10.62051/ijgem.v6n2.12>, Date Retrieved: March 3, 2026
- [15] Yusok, N. M. H., & Alfadhilani. (2024). Proposal for improvement of the inventory control system of automotive spare parts at PT automotive Padang. AIP Conference Proceedings, 2891, 070030. URL: <https://doi.org/10.1063/5.0208037>, Date Retrieved: January 27, 2025
- [16] Zhang, S., Huang, K., & Yuan, Y. (2021). Spare parts inventory management: A literature review. *Sustainability*, 13(5), 2460. URL: <https://doi.org/10.3390/su13052460>, Date Retrieved: September 18, 2024